

**CITY OF SAN DIEGO  
M E M O R A N D U M**

DATE: August 23, 2012

TO: Balboa Park Committee, Agenda of September 6, 2012

FROM: Jacques Chirazi, Program Manager, and Mayor's Economic Growth Services

SUBJECT: Smart City San Diego Project at the San Diego Zoo

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**SUMMARY**

**Project Goal:**

The goal of the project is to install state-of-the-art technology to allow visitors to the San Diego Zoo to charge their electric vehicles. This project will be one of the first in the nation to demonstrate using the sun to directly charge electric vehicles.

**Benefits to Balboa Park Users:**

This publically accessible project will encourage electric vehicle users to visit the Zoo and Balboa Park, provide shade for Zoo patrons and help the Zoo and Balboa Park with their sustainability goals.

**Technology:**

Located in the main parking lot at the Zoo, the project will consist of a solar photovoltaics system that will harness energy from the sun to charge cars, use advanced battery technology to store solar power for future use and provide renewable energy to the community. Unique to this project is state-of-the-art power electronics that will receive input from the solar array, provide energy to the battery, charge the plug-in electric vehicles, provide renewable energy to the grid and allow the grid controller to dispatch energy from the battery to help offset peak demand.

**Educational Benefits:**

A website, accessible to the public, will provide visitors with information about electric vehicles, advanced energy storage, solar energy, the Zoo and Balboa Park's successes in achieving energy efficiency and sustainability goals and information to support the Balboa Park 2015 Centennial Celebration.

**Timeline:**

The project plans to break ground on September 4, 2012 and complete construction by year end 2012. The project team will work with the San Diego Zoo and City Park & Recreation to avoid construction during periods of high attendance at the Zoo and City permitted events that require use of the Zoo parking lot.

## BACKGROUND

The project is a partnership between the San Diego Zoo and Smart City San Diego, a broad public-private collaboration between General Electric, San Diego Gas and Electric (SDG&E), City of San Diego, the University of California San Diego and CleanTECH San Diego. Smart City San Diego aims to improve the region's energy independence, empower consumers to adopt electric vehicles, reduce greenhouse gas emissions and drive economic growth. This project meets the goals of increasing the City-wide expansion of plug-in electric vehicle (PEV) charging stations, expediting the permit process and using renewable energy for DC to DC charging.

The project will be implemented by SDG&E's Sustainable Communities Program (SCP). The SCP has been installing clean energy systems on highly energy efficient, sustainable projects since 2004. To date the SCP has installed 32 photovoltaic systems and a fuel cell for a total of just over 4.1 MW.

San Diego County has the highest penetration of electric vehicles in the nation with just over 1,700 plug-in electric vehicles. San Diego also leads the way in solar installations with over 18,000 PV systems installed for a total of 139 MW of renewable generation.

The project will serve as a model to be replicated at multiple sites throughout the San Diego region.

## DISCUSSION

The project will consist of ten solar canopies, each canopy a 9 kW photovoltaic array, for a total of 90 kW. There will be two rows of canopies located in the main Zoo parking lot, running west to east, between the main Zoo parking lot entrance driveway and Park Boulevard. This location is consistent with short-term and long-term parking plans. Four dedicated parking spaces will be required for the planned four PEV chargers and a fifth PEV charger will be located in an ADA accessible parking space. The balance of the equipment will be located in an equipment enclosure located in the south-east corner of the parking lot. The equipment enclosure will be surrounded on three sides with fast growing plants. The advanced battery technology used to store solar power for future use will have a power rating of 100 kW and an energy capacity of 100 kW hours.

Architecturally each of the ten solar canopies will consist of four rectangular areas of photovoltaic panels arranged with spaces in between to add visual impact. The four photovoltaic panel areas will be attached to steel beams forming a trellis. The entire structure will be supported by two steel posts. The steel posts will be protected from vehicle impact by being encased in a tapered concrete base. Inspiration for the coloring of the solar canopies, the steel beams supporting the solar panels and the concrete base will use visual cues from nearby structures. The color of the steel beams and the concrete bases will be similar to the color of the trellis design at the Zoo entrance. The concrete bases could be imprinted with animal prints to further strengthen the link to the Zoo.

The educational display will be designed to provide information about the project, the sustainability efforts of the Zoo and Balboa Park and information to support the Balboa Park 2015 Centennial Celebration. The educational display will be web-based and available on-line. SDG&E will work with the Zoo on the optimal location for the education display to maximize public exposure. Similar to signage at the Zoo, signage will be located near the project to provide educational information and direct visitors to the website. Real-time feed from the solar photovoltaics system will show daily, weekly, monthly and annual energy production.

See attachments for more detailed illustrations.

#### ALTERNATIVES

No alternatives have been proposed at this time.

#### ATTACHMENTS

Solar Canopy Design